Notes on a Collection of Termites from the East Indian Archipelago.

Ву

Masamitsu Oshima

Institute of Science, Government of Formosa.

With Plates IX and X.

In the present paper is given a record of two collections of termites. The first was obtained by Mr. Ryozo Kanehira, expert of the Experimental Forestry Station of the Government of Formosa, during his tour to the Malayan Archipelago in the spring of 1913. The second was obtained at Los-Banos, Luzon, by Prof. C. E. Baker, of the University of the Philippines.

The interest of these collections resides not only in the large number of new species they reveal, but also in presenting localities new to the termite collector. I have referred the specimens to the following twenty-four species, of which nineteen seem to be new to science:

- 1. Coptotermes dobonicus n. sp.
- 2. Coptotermes travians (Hav.).
- 3. Coptotermes bornensis n. sp.
- 4. Coptotermes menadoensis n. sp.
- 5. Coptotermes flavicephalus n. sp.
- 6. Coptotermes hongkonensis n. sp.
- 7. Parrhinotermes inæqualis (Hav.).
- 8. Rhinotermes (Schedorhinotermes) longirostris (Brauer).
- 9. Rhinotermes (Schedorhinotermes) tarakanensis n. sp.
- 10. Termes (Macrotermes) manilanus n. sp.
- 11. Termes (Macrotermes) philippinensis n. sp.

M. OSHIMA:

554

- 12. Termes (Macrotermes) luzonensis n. sp.
- 13. Termes (Termes) Copelandi n. sp.
- 14. Odontotermes (Odontotermes) celebensis n. sp.
- 15. Eutermes (Hirtitermes) spinocephalus n. sp.
- 16. Eutermes (Eutermes) buitenzorgi Holmgr.
- 17. Eutermes (Eutermes) doboensis n. sp.
- 18. Eutermes (Eutermes) sandakanensis n. sp.
- 19. Eutermes (Sublitermes) Kanchiræ n. sp.
- 20. Eutermes (Tumulitermes) boetoni n. sp.
- 21. Eutermes (Trinervitermes) menadoensis n. sp.
- 22. Eutermes (Grallatotermes) luzonicus n. sp.
- 23. Microcerotermes los-banosensis n. sp.
- 24. Microcerotermes distans (Hav.).

Here I express my sincere thanks to Prof. Baker and Mr. Kanehira, both of whom very kindly forwarded to me the interesting materials for examination.

The classification adopted in the following is that of Holmgren.

Family MESOTERMITIDÆ.

Subfamily COPTOTERMITINÆ.

Genus Coptotermes Wasmann.

1. Coptotermes dobonicus nov. sp.

(Pl. IX., fig. 3).

Imago unknown.

Soldier.—Head pale yellow; mandible brown; abdomen whitish. Head sparingly pilose; abdominal tergites densely provided with delicate hairs.

Head ovoid, slightly flattened; orifice of fontanelle directed for-

ward, somewhat inclined; basal portion of clypeus short; labrum tongue-shaped, with hyaline, triangular tip, reaching beyond middle of mandibles; mandibles sabre-shaped, with incurved piercing tip; antennæ 17-jointed, 3rd joint shorter than 2nd; pronotum broad, anterior and posterior borders indented in the middle.

•	Length of body	6,00 mm.
	Length of head with mandible	2,69 mm.
	Length of head without mandible	1,66 mm.
	Width of head	1,41 mm.
	Width of pronotum	1,06 mm.
	Length of pronotum	0,59 mm.

Worker.—Head and abdomen whitish; head stout; antennæ 16jointed, 2nd joint as long as 3rd; anterior border of pronotum slightly indented in the middle, posterior border rounded.

Length of body	 	 		 	б,00 mm.
Width of head	 	 	** *	 	1,47 mm.
Width of pronotum	 	 		 	0,91 mm.

Habitat.—Dobo, Arue Island (Dutch New Guinea); collected by Mr. Kanehira on May 6, 1913.

Remarks.—This species is closely allied to Coptotermes curvignathus Holmgren. However, a close comparison of the two species shows several discrepancies. Thus, in C. dobonicus the soldier is provided with much longer head and with antennæ which are 17-jointed instead of being 14—16-jointed. In the workers, the most notable difference lies in the number of antennal joints, which in the present species number 16, the 2nd joint being as long as the 3rd, while in C. curvignathus the antennæ are 15-jointed, the 2nd joint being much longer than the 3rd.

2. Coptotermes travians (Haviland).

Soldier.—Head yellow; mandibles brown; abdomen whitish. Head sparingly pilose; abdominal tergites densely provided with subequal hairs.

556 M. OSHIMA:

Head oval, slightly vaulted dorsally, sides converging anteriorly; fontanelle tube-shaped, large, its orifice directed forward, reaching beyond the basal portion of clypeus; basal portion of clypeus very short; labrum triangular, with hyaline tip, reaching to middle of mandibles; antennæ 14-jointed, 3rd joint as long as 2nd; submentum contracted very weakly in the middle; pronotum slightly longer than half the width, anterior border distinctly indented in the middle, posterior border slightly emarginate at middle.

Habitat.—Tarakan, Dutch Borneo; collected by Mr. Kanehira on May 23, 1913.

3. Coptotermes bornensis nov. sp.

(Pl. IX., Fig. 2).

Imago unknown.

Soldier.—Head yellow, darker anteriorly; mandibles brown. Head and abdominal tergites densely provided with delicate hairs, the latter without special series of spiny hairs.

Head oval, vaulted dorsally, sides slightly converging anteriorly; fontanelle directed forward; basal portion of clypeus very short; labrum triangular, apex hyaline, scarcely reaching to middle of mandibles; antennæ 13-jointed, 2nd joint longer than 3rd, 4th joint as long as 3rd; submentum strongly contracted in the middle; pronotum slightly longer that half the width, anterior border strongly indented in the middle, posterior border slightly emarginate at middle; dorsal surface of abdomen with two longitudinal dark bands.

Length of body	• •			4,00 mm.
Length of head with mandible		• •		1,94 mm.
Length of head without mandible				1,34 mm.
Width of head			• •	1,00 mm.
Width of pronotum			• , •	0,75 mm.
Length of pronotum				0,41 mm.

Worker.—Head pale yellow; abdomen whitish. Head provided with delicate hairs; hairs on abdominal tergites longer and subequal.

Fontanelle indistinct; basal portion of clypeus short, slightly swollen; antennæ 13-jointed, 2nd joint longer than 3rd; pronotum rather smaller, anterior border considerably emarginate at middle, posterior border rounded.

Length of body	 • •	٠	•, •	 • •	·	4,00 mm.
Width of head	 	• •		 		0,97 mm.
Width of pronotum	 			 		0,66 mm.

Habitat.--Balik-Papan, Dutch Borneo; collected by Mr. Kanehira on April 20, 1913.

Remarks.—This species is closely related to Coptotermes travians (Haviland). But in the soldier of C. bornensis the contraction in the middle part of submentum is markedly stronger than in C. travians and the antennæ are 14-jointed instead of being 13-jointed. With the workers alone on hand, I have found it scarcely possible to draw a fast line between the two species.

4. Coptotermes menadoensis nov. sp.

Soldier and worker unknown.

Imago. Body yellowish brown; clypeus, antennæ, legs, and the ventral side of abdomen straw-colored; mandibles reddish brown, apex darker; wings hyaline, outer border yellowish. Head densely provided with spiny hairs; along the posterior border of abdominal tergites two series of hairs, of which the anterior ones are the shorter.

Head rounded; fontanelle indistinct, dotted, slightly swollen;

transversal band longer in the middle than in sides; forehead inclined; basal portion of clypeus very short, slightly swollen; eyes somewhat prominent; ocelli approximated to eye; antennæ 22-jointed, 2nd joint slightly longer than 3rd, 4th joint twice as long as 3rd; pronotum longer than half the width, anterior border broadly concave, posterior border weakly indented in the middle; mesonotum and metanotum considerably narrower than pronotum, their posterior border slightly emarginate at middle; anterior wing-stumps much larger than the posterior wing, covering the basal parts of the latter; membrane of the wings densely provided with hairs; median nerve runs near to cubitus, branched in apical area; cubitus with ca. 7 branches, of which the proximal ones are the stronger.

14,00-16,50 mm. Length of body with wings.. 11,00-12,00 mm. Length of anterior wing 6,50- 8,00 mm. Length of body Length of head 1,34 mm. 1,41- 1,50 mm. Width of head 1,53- 1,66 mm. Width of pronotum 0,94- 1,03 mm. Length of pronotum Habitat.-Menado, Celebes; collected by Mr. Kanehira on May 15, 1913.

5. Coptotermes flavicephalus nov. sp.

(Pl. IX., fig. 1).

Imago unknown.

Soldier.—Head pale yellow; mandibles brown; abdomen straw-coloured. Head sparingly pilose; abdominal tergites densely provided with hairs.

Head suborbicular, broad and flattened; fontanelle directed forward; basal portion of clypeus short; labrum tongue-shaped, with pointed tip, scarcely reaching to middle of mandibles; mandibles with strongly incurved tip; antennæ 15-or 16-jointed, 3rd joint nearly as

long as 2nd; pronotum broad, anterior and posterior borders indented in the middle.

Worker.—Head yellowish white; abdomen whitish. Head sparingly pilose; abdominal tergite moderately provided with subequal hairs.

Antennæ 15-jointed, 3rd joint shorter than 2nd; anterior border of pronotum distinctly indented in the middle, posterior border straight.

Length of body5,00 mm.Width of head1,44 mm.Width of pronotum0,78 mm.

Habitat.—Los-Banos, Luzon; collected by Prof. Baker.

Remarks.—The present species is very closely allied to *Coptotermes* curvignathus Holmgren. But the head of soldier is much larger and the pronotum of same is broader.

6. Coptotermes hongkonensis nov. sp.

(Pl. IX., fig. 5).

Imago unknown.

Soldier.—Head pale yellow; mandibles brown; abdomen milk-white. Head sparingly pilose; abdominal tergites with dense, subequal hairs, no series of spiny hairs.

Head oval, slightly flattened, sides considerably converging anteriorly; fontanelle directed forward; basal portion of clypeus short; labrum lancet-shaped, tip pointed, not hyaline, scarcely reaching to middle of mandibles; mandibles saber-shaped, slender; antennæ 15-jointed, 3rd joint minute, half as long as 2nd; submentum slightly

contracted at middle; pronotum considerably longer than half the width, anterior and posterior border indented in the middle.

Worker.—Head yellowish; abdomen straw-colour. Head and abdominal tergites provided with delicate hairs, those on the latter longer.

Head quadrate, its posterior border rounded; basal portion of clypeus longer than half the width; fontanelle and sutures of head indistinct; antennæ 14-jointed, 2nd joint longer than 3rd; pronotum much narrower than head, anterior and posterior border indented at middle.

Remarks.—Coptotermes hongkonensis is a species closely agreeing with C. travians (Haviland) and C. dobonicus Oshima. However, it differs from the former in the number of antennal joints and the length of head in soldiers, and from the latter in the number of antennal joints as well as in the degree of contraction of the middle of submentum in the soldiers. Coptotermes Gestroi Wasmann (not of Haviland) is still another nearly allied species, but the soldier has broader head and the abdominal tergites are provided with a series of spiny hairs along the posterior border.

Subfamily RHINOTERMITINÆ.

Genus Parrhinotermes Holmgren.

7. Parrhinotermes inæqualis (Haviland).

(Pl. X., fig. 1).

Soldier.—Head brownish yellow; basal portion of mandible yellow, apical portion brown; abdomen straw-colour. Head very sparingly pilose; abdominal tergites provided with a series of hairs along the posterior border; submentum densely pilose.

Head stout, flattened, posterior border straight, sides converging anteriorly; fontanelle round and minute, a shallow groove running from it to apex of labrum and giving two branches to the condyle of mandible around basal part of clypeus; basal portion of clypeus short, flattened; labrum quadrangular, as long as broad, apical third hyaline, apex obtuse, provided with a cluster of short coarse hairs; mandibles stout, with elongated and slender apical portion, proximal portion broad; left mandible provided with two teeth, of which the first one is larger than the second and is leaf-shaped, while the latter is somewhat triangular, short, its tip directed forward, and has the median portion of masticating border distinctly serrated; right mandible provided with a triangular tooth, with obtuse tip, the basal portion of masticating border serrated; antennæ 13-jointed, 3rd joint longer than 2nd; pronotum minute, anterior border convex, posterior border slightly concave.

Length of body	٠.	 •	4,50 mm.
Length of head with mandible		 	2,03 mm.
Length of head without mandible		 ٠. ٠	1,47 mm.
Width of head		 • • ,	1,28 mm.
Width of pronotum		 ٠	0,72 mm.
Length of pronotum		 	0,38 mm.

Worker.—Head pale yellow; abdomen yellowish white. Head densely provided with hairs; abdominal tergites moderately pilose.

Head quadrangular, with rounded posterior border, much broader than long; fontanelle indistinct; basal portion of clypeus flat, short; labrum strongly inclined downwards; antennæ 13-jointed, 3rd joint as long as 2nd; pronotum saddle-shaped, anterior border scarcely indented at middle; mesonotum and metanotum broader than pronotum.

hira on April 21, 1913.

Genus Rhinotermes Hagen.

8. Rhinotermes (Schedorhinotermes) longirostris (Brauer).

(Pl. X., figs. 3-4).

Soldier (larger form).— Head yellow; mandibles brown; abdomen straw-colour. Body sparingly provided with hairs.

Posterior part of head quadrangular, sides of the anterior half abruptly converging anteriorly; fontanelle distinct, directed upwards, situated between antennal fossa; from the fontanelle runs a shallow groove, reaching to apex of labrum, widening anteriorly; clypeus grooved along the median line, boundary between apical and basal portions indistinct, the former whitish; labrum tongue-shaped, longer than broad, apical part two-lobed, sparlingly provided with hairs, reaching beyond tip of mandible; mandibles stout, the left provided with two teeth, the right with one tooth; antennæ 16-jointed, 2nd joint as long as 3rd, 4th joint half as long as 3rd; pronotum flat, anterior border convex, posterior border slightly emarginate at middle; mesonotum shorter and narrower than pronotum; metanotum much broader than pronotum; abdomen flattened, broad and short.

EAST INDIAN TERMITES.

Length of body	·	 . •	4,50 mm.
Length of head with mandible		 	2,09 mm.
Length of head without mandible		 	1,34 mm.
Width of head		 	1,38 mm.
Width of pronotum			0,75 mm.
Length of pronotum		 	0 44 mm.

Soldier (smaller form).—Head pale yellow; mandibles light brown; abdomen straw-colour. Head sparingly pilose; abdominal tergites provided with a series of longer spiny hairs.

Head slightly vaulted dorsally, with rounded posterior border, sides of anterior part abruptly converging anteriorly; fontanelle round with a deep groove running from it to tip of labrum; forehead strong-ly inclined; clypeus tongue-shaped, swollen on both sides of the median groove, apical part whitish; labrum rectangular, much longer than broad, reaching beyond tip of mandibles, median groove deep, widened anteriorly, tip two-lobed, whitish, its outer border with dense hairs, the dorsal surface sparsely provided with hairs; mandibles slender, tip abruptly incurved, the left provided with two teeth, the right with one; antennæ 15-jointed, 2nd joint twice as long as 3rd; pronotum minute, with convex anterior and straight posterior border; mesonotum as broad as pronotum; metanotum broader than pronotum.

I ength of body					2 20 mm
Length of body	• •		• •	• •	3,20 111111
Length of head with mandible		. • •			1,34 mm.
Length of head without mandible					0,81 mm.
Width of head	, • •	• •			0,75 mm.
Width of pronotum					0,50 mm.
Length of pronotum					0,34 mm.

Worker.—Head yellowish white; abdomen whitish. Head slightly covered with hairs; abdominal tergites with two irregular series of spiny hairs.

Head quadrate, posterior border rounded; fontanelle indistinct;

M. OSHIMA:

basal portion of clypeus markedly swollen; antennæ 16-jointed, 2nd joint longer than 3rd, 4th joint half as long as 3rd. Length of body • • • • • • • 4,20 mm. Width of head . . 1,31 mm. Width of pronotum Habitat.-Maros, Celebes; collected by Mr. Kanehira on April 25, 1914. 9. Rhinotermes (Schedorhinotermes) tarakanensis nov. sp. (Pl. X., fig. 2). Imago and the larger form of soldiers unknown. Soldier (smaller form).—Very closely resembling same of R. longirostris, but somewhat smaller. Antennæ 14-jointed, 2nd joint as long as 3rd, 4th joint shorter than 3rd. Length of body 2.80 mm. Length of head with mandible.. 1,28 mm. Length of head without mandible ... 0,75 mm. Width of head 0,67 mm. Width of pronotum 0,47 mm. Length of pronotum 0,31 mm. Worker.—Agreeing in all characters with those of R. longirostris, but somewhat smaller.

Antennæ 15-jointed, 2nd joint longer than 3rd.

Length of body 3,50 mm.

Width of pronotum o,53 mm.

Habitat.—Tarakan, Dutch Borneo; collected by Mr. Kanehira on May 23, 1913.

Family METATERMITIDÆ.

Genus Termes (L.) Homgren.

10. Termes (Macrotermes) manilanus nov. sp.

Imago.—Body chestnut brown, paler on ventral side; basal portion of clypeus yellow; the antennæ, the T-shaped patch on pronotum, the antero-lateral corners of same, the anterior border of mesonotum, and the metanotum brownish yellow; wings yellowish brown, with yellowish subcostal band. Head sparingly pilose; abdominal tergites provided with subequal hairs; labrum, pronotum, and wing-stumps densely haired.

Head broadly oval, with sides slightly converging anteriorly, somewhat flattened; eyes very large and prominent; ocelli separated from eye by a distance equal to their radius; fontanelle indistinct, slightly elevated; top of head surrounding the fontanelle somewhat depressed; basal portion of clypeus very large, shorter than half its width, markedly swollen; antennæ 19-jointed, 3rd joint slightly longer than 2nd, 4th joint shorter than 3rd; pronotum semicircular, broader than head, anterior border concave, posterior border slightly emarginate at middle; mesonotum and metanotum as broad as pronotum, their posterior border concave; membrane of wings densely covered with hairs; median nerve runs near to cubitus, starting from the wing-stump, branched in the middle area of wing, with ca. 5 branches; cubitus with ca. 10 branches, of which the proximal ones are the stronger.

Length of	of body w	ith wi	ng	• •	 	• • •		27,00 mm.
Length of	of body w	rithout	wing	g.,	 			14,00 mm.
Length of	of anterior	wing			 		• • .	23,00 mm.
Length o	of head			• • •	 			1,88 mm.
Width o	f head				 			2,00 mm.

M. OSHIMA:

Remarks.—This species is closely allied to *Termes gilvus* Hagen, but is greatly different in the dimensions of hand. Thus, in *T. manilanus* head is 1,88 mm. long and 2,00 mm. broad, instead of of 2,66 mm. long and 2,28 mm. broad as in *T. gilvus*.

11. Termes (Macrotermes) philippinensis nov. sp.

(Pl. IX., figs. 8-9).

Imago.—Body chestnut brown, ventral side paler; basal portion of clypeus, labrum, antennæ, the T-shaped patch on pronotum and antero-lateral corners of same brownish yellow; wings brown. Head densely pilose, short delicate hairs being intermingled with longer spiny hairs; abdominal tergites densely beset with minute hairs; wing-stumps moderately pilose.

Head round, with sides considerably converging anteriorly; eyes moderately large; ocelli separated from eye by a distance greater than their diameter; fontanelle dotted, reddish, somewhat elevated; transversal band depressed; basal portion of clypeus slightly shorter than half its width but not very short, markedly swollen; antennæ 19-jointed, 2nd joint much longer than 3rd, 4th joint as long as 3rd; pronotum nearly as broad as head, slightly shorter than half the width, nearly saddle-shaped, antero-lateral corners markedly depressed, middle of anterior and posterior border indented; basal portion of median nerve coalescent with cubitus, the former with about 4 branches in the apical portion, the latter with 10 branches, most of them forked.

Length of body with wing 26,00 mm.

Length of body without wing 13,00 mm.

EAST INDIAN TERMITES.

Length of anterior wing		 	 	21,50 mm.
Length of head		 	 	1,50 mm.
Width of head	٠	 	 	2,00 mm.
Width of pronotum		 	 	2,19 mm.
Length of pronotum		 	 	1,25 mm.

Soldier (the larger form).—Head reddish brown; abdomen yellowish; labrum, antennæ, and legs dark yellow. Head and abdominal tergites smooth.

Head quadrangular, sides converging anteriorly; fontanelle distinct, minute, situated in front of the centre of head; basal portion of clypeus short, posteriorly not separated from forehead; labrum tongue-shaped, with triangular hyaline tip; mandibles stout, tip slightly incurved; antennæ 17-jointed, 3rd joint slightly longer than 2nd; pronotum broad, anterior and posterior border distinctly indented in the middle; sides of mesonotum and metanotum rounded.

Length of body					 	9,50 mm.
Length of head	with 1	mandik	ole		 	4,84 mm.
Length of head	with	out ma	ndible		 	3,28 mm.
Width of head				٠	 	2,78-2,88 mm.
Width of pronot	um				 	2,47-2,56 mm.
Length of prono	tum				 	1,12-1,25 mm.

Soldier (the smaller form).—Head reddish brown; labrum, antennæ and legs somewhat paler; mandibles reddish brown; abdomen straw-colour. Head smooth; abdominal tergites provided with microscopically minute hairs, two or three posterior tergites with longer hairs.

Head rectangular, sides strongly converging anteriorly; fontanelle indistinct; basal portion of clypeus short, not distinctly separated from forehead; labrum lancet-shaped, with pointed hyaline tip; mandibles sabre-shaped, tip strongly incurved; antennæ 17-jointed, 2nd joint as long as 3rd, 4th joint slightly shorter than 3rd; pronotum semicircular, anterior and posterior borders weakly indented in the

M. OSHIMA:

middle; mesonotum considerably narrower than pronotum, sides rounded, posterior border slightly concave; metanotum as broad as pronotum, oval, posterior border straight.

Length of body 6,00-7,00 mm. Length of head with mandible 3,68-3,75 mm. Length of head without mandible ... 1,81-1,94 mm. Width of head 1,56-1,69 mm. Width of pronotum I,4I-I,44 mm. Length of pronotum ... 0,78-0,84 mm. Worker (the larger form).—Head reddish yellow; abdomen

Worker (the larger form).—Head reddish yellow; abdomen yellowish. Head and abdomen sparingly pilose.

Head quadrate, with rounded posterior border; basal portion of clypeus markedly swollen; fontanelle whitish, round; antennæ 18-jointed, 2nd joint nearly as long as 3rd, 4th joint half as long as 3rd; pronotum saddle-shaped, anterior and posterior border indented at middle.

 Length of body
 6,50 mm.

 Width of head
 2,00 mm.

 Width of pronotum
 1,09-1,19 mm.

Worker (the smaller form).—Paler and smaller. Antennæ 17-jointed; 2nd joint slightly longer than 3rd, 4th joint as long as 3rd.

 Length of body
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 5,00 mm.

 Width of head
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Habitat.—Los-Banos, Luzon; collected by Prof. Baker.

Remarks.—This species agrees well with *Termes (M.) gilvus* Hagen except in dimensions of head in the larger form of soldiers and workers. Moreover, in the present species, the smaller form of soldiers is provided with rectangular head while in *T. gilvus* this is of an oval shape.

12. Termes (Macrotermes) luzonensis nov. sp.

(Pl. IX., figs. 10-11).

Imago unknown.

Soldier (the larger form).—Head reddish brown; abdomen dark yellow. Head and abdominal tergites smooth.

Head broadly oval, posterior border rounded, sides converging anteriorly, slightly vaulted dorsally; no rudiment of eye; fontanelle situated in front of the centre of head, round, minute; basal portion of clypeus very short; labrum tongue-shaped, short, with triangular hyaline tip; mandibles short, stout; antennæ 17-jointed, 3rd joint as long as 2nd, 4th joint as long as 5th and slightly shorter than 3rd; pronotum broad, anterior and posterior border distinctly indented in the middle, anterior border convex; mesonotum oval, narrower than pronotum, posterior border slightly emarginate at middle; metanotum as broad as mesonotum, posterior border straight; sides of meso-and metanotum rounded.

Length of body			 7,50–8,00 mm.
Length of head with mandible			 4,13 mm.
Length of head without mandible	·	• •	 2,66-2,75 mm.
Width of head		• •	 2,25-2,28 mm.
Width of pronotum			 1,88-1,94 mm.
Length of pronotum			 1,03–1,09 mm.
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Soldier (the smaller form).—Rather paler and smaller than the above larger form.

Head yellow; abdomen straw-colour. Head smooth; abdominal tergites provided with microscopical hairs, longer hairs intermingled with such in the posterior tergites.

Head broadly oval, sides slightly converging anteriorly; labrum long, slender, lancet-shaped, with obtuse hyaline tip; mandibles slender; basal portion of clypeus slightly swollen; fontanelle indistinct; antennæ 17-jointed, 2nd and 3rd joints as long as 4th; pronotum

M. OSHIMA:

very much narrower than head, longer than half the width, anterior and posterior border indented in the middle, the former convex; mesonotum narrower than pronotum; metanotum as broad as pronotum; sides of meso-and metanotum rounded.

Length of body	 • •			5,50 mm.	
Length of head with mandible	 		•	2,97 mm.	
Length of body without mandible	 			1,72 mm.	
Width of head	 		•	1,45 mm.	
Width of pronotum	 			1,09 mm.	
Length of pronotum	 			0,69 mm.	
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Worker.—Head yellow; abdomen straw-colour. Head and abdominal tergites sparingly provided with subequal hairs.

Head round; fontanelle spotted, whitish; basal portion of clypeus swollen; antennæ 17-jointed, 3rd joint shorter than 2nd, 4th joint as long as 3rd; pronotum saddle-shaped, provided with a median shallow longitudinal groove, anterior border strongly elevated and indented in the middle, posterior border emarginate at middle.

Length of body	٠.							4.50 mm.
Width of head							• ,•	1,66 mm.
Width of pronotum			ø 0				••	0,90 mm.
Habitat.—Los-Banos.	Luz	on:	colle	cted	bv	Prof.	Bak	ter.

13. Termes (Termes) Copelandi nov. sp.

(Pl. IX., figs. 6-7).

Imago unknown.

Soldier (the larger form).—Head brownish red, antennæ and legs paler; abdomen dark yellow. Head smooth; abdominal tergites provided with microscopical hairs.

Head cylindrical, sides very slightly converging anteriorly; fontanelle dotted, minute, situated in the centre of head; basal portion of clypeus very short; labrum lancet-shaped, with pointed hyaline tip; mandibles short, stout; antennæ 17-jointed, 2nd joint as

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long as 3rd, 4th joint slightly shorter than 3rd; pronotum broad, anterior and posterior border distinctly indented in the middle, the former slightly elevated; meso-and metanotum considerably narrower than pronotum, their lateral margins rounded, posterior borders concave.

Soldier (the smaller form).—Head yellow; abdomen straw-colour. Head smooth; abdominal tergites moderately pilose, hairs microscopical.

Head oval, sides slightly converging anteriorly; fontanelle minute; labrum lancet-shaped, elongated, with hyaline tip; antennæ 17-jointed, 2nd and 3rd joint as long as 4th; pronotum slightly narrower than head, anterior and posterior borders weakly indented at middle, the former convex.

 Length of body
 ...
 6,00 mm.

 Length of head with mandible
 ...
 3,09-3,19 mm.

 Length of head without mandible
 ...
 1,69-1,75 mm.

 Width of head
 ...
 ...
 1,47-1,56 mm.

 Width of pronotum
 ...
 ...
 ...
 ...

 Length of pronotum
 ...
 ...
 ...
 ...
 ...

Length of pronotum 0,72 mm.

Worker (the larger form).—Head yellow; abdomen whitish; antennæ brownish. Head sparingly pilose; abdominal tergites provided with subequal hairs.

Head round; fontanelle whitish, round; no rudiments of eye; forehead in front of fontanelle depressed; basal portion of clypeus shorter than half the width, slightly swollen; pronotum saddle-shaped; antennæ 18-jointed, 2nd joint as long as 3rd, 4th joint shorter than 3rd.

M. OSHIMA:

Length of body ... 5,00 mm. 1,06 mm. Width of head ... 1,88 mm. Width of pronotum Worker (the smaller form).-Apical portion of clypeus whitish, its basal portion half as long as broad, markedly swollen; antennæ 17-jointed, 3rd and 4th joints subequal, considerably shorter than 2nd. Length of body Width of head 1,88 mm. Width of pronotum Habitat. - Los-Banos, Luzon; collected by Prof. Baker.

Genus Odontotermes Holmgren.

14. Odontotermes (Odontotermes) celebensis nov. sp.

(Pl. IX., fig. 12).

Imago unknown.

Soldier—Head yellow; mandible brown, basal part paler; abdomen straw-colour. Head sparingly pilose; abdominal tergites densely provided with hairs.

Head ovoid; basal portion of clypeus short, not distinctly separated from forehead, its apical portion quadrate, short, with rounded anterior corners; labrum tongue-shaped, apex pointed, not reaching to middle of mandible; mandibles sabre-shaped, with incurved piercing tip, the left mandible provided with a sharp tooth near the middle of cutting edge, the right with a rudimental tooth in the same position; antennæ 17-jointed, 2nd joint as long as 3rd and 4th taken together; submentum rectangular, three times as long as broad, slightly converging anteriorly; pronotum narrower than head, saddle-shaped, anterior and posterior borders indented at middle, the former two-lobed, elevated.

Length of head without mandible			1,72-1,88 mm.
Width of head			1,50-1,66 mm.
Width of pronotum	٠		1,00-1,13 mm.
Length of pronotum		٠	0,59-0,72 mm.

Worker (the larger form).—Head yellow, abdomen whitish. Head sparingly provided with spiny hairs; abdominal tergites with a series of spiny hairs along the posterior border.

Head round; fontanelle indistinct; basal portion of clypeus markedly swollen; antennæ 17-jointed, 2nd joint slightly longer than 3rd; anterior border of pronotum two-lobed, slightly elevated.

Length of body	 	• •	 	 	4,50 mm.
Width of head	 		 	 	1,47 mm.
Width of pronotum	 	• •.	 		0,84 mm.

Worker (the smaller form).—Antennæ 17-jointed, 2nd joint as long as 3rd and 4th taken together; anterior border of pronotum slightly concave at middle.

Length of body	 • •	 • •	 • •	 4,00 mm.
Width of head	 	 	 	 1,00 mm.
Width of pronotum				

Habitat.—Maros, Celebes (April 25, 1913); Menado, Celebes (May 19, 1913); Talisay Island (date unknown); all collected by Mr. Kanehira.

Remarks.—In the present species, the soldiers vary greatly in the dimensions of head. But as there exist intermediate forms between extreme forms, it is impossible to draw a fast line to distinguish them into two castes. M. OSHIMA:

574

Genus Eutermes Fr. Müller.

15. Eutermes (Hirtitermes) spinocephalus nov. sp.

(Pl. X., fig. 7).

Imago unknown.

Soldier.—Head and pronotum brownish yellow; rostrum slightly darker; antennæ paler; abdominal tergite grey; sternite greyish yellow. Head, basal part of rostrum, and thorax densely provided with very strong spiny hairs; abdominal tergites with two series of stiff spiny hairs.

Head broadly oval, short; rostrum stout, markedly elongated, its anterior surface making a marked curve with the anterior surface of head; proximal part of antennæ prominent; antennæ 13-jointed, each joint elongated, 3rd joint as long as 1st and more than twice as long as 2nd, 4th joint shorter than half the length of 3rd and as long as 5th; pronotum saddle-shaped, anterior border emarginate at middle; legs slender, long; cerci strong, pointed.

Length of body	 • •	 	5,00 mm.
Length of head with rostrum	 	 	2,19 mm.
Length of head without rostrum	 	 ٠, ٠	1,22 mm.
Width of head	 . ,	 	1,00 mm.
Width of pronotum	 	 	0,53 mm.

Worker.—Coloration and hairiness as in soldier. Pronotum somewhat paler; labrum densely provided with minute hairs.

Head pentagonal, flattened, with rounded corners; sutures of head distinct, whitish; fontanelle triangular; basal portion of clypeus very short, four times as broad as long, slightly swollen; antennæ 14-jointed, 3rd joint shorter than twice the length of 2nd, 4th joint shorter than 2nd and 5th; pronotum saddle-shaped, anterior border scarcely emarginate at middle.

Length of body 5,00 mm.

Habitat.—Tarakan, Dutch Borneo; collected by Mr. Kanehira on May 23, 1913.

Remarks.—The nearest relative of this species appears to be *Eutermes* (*H.*) *hirtiventris* Holmgren. However, the soldiers differ from those of that species in having head densely provided with spiny hairs, instead of being naked.

16. Eutermes (Eutermes) buitenzorgi Holmgren.

(Pl. X., fig. 13).

Imago unknown.

Soldier.—Head reddish yellow; rostrum brownish; antennæ, legs and abdominal tergites rusty yellow, shiny. Head pilose, microscopical hairs mingled with longer spiny hairs; abdominal tergites provided with short hairs, with a series of spiny hairs along posterior border.

Head stout, ovoid: rostrum conical, its anterior surface in level with surface of head, slightly swollen dorsally at junction of rostrum; antennæ 13-jointed, 3rd joint as long as 1st and longer than 2nd; pronotum saddle-shaped, anterior border weakly emarginate at middle.

Worker.—Head reddish brown; abdomen straw-colour; basal portion of clypeus paler. Head moderately pilose, mingling a few longer spiny hairs. Abdominal tergites provided with longer subequal hairs.

Head pentagonal, with rounded posterior border; sutures of head distinct, whitish; middle part of transversal band depressed; basal portion of clypeus shorter than half the width, considerably swollen;

M. OSHIMA:

antennæ 14-jointed, 2nd joint nearly as long as 4th; pronotum saddle-shaped, anterior border weakly indented in the middle.

 Length of body
 ...
 ...
 4.00 mm.

 Width of head
 ...
 ...
 ...
 1,15 mm.

 Width of pronotum
 ...
 ...
 0,60 mm.

Habitat.—Pengaran, Johore; collected by Mr. Kanehira on August 2, 1913.

17. Eutermes (Eutermes) doboensis nov. sp.

(Pl. X., fig. 12).

Imago unknown.

Soldier.—Head pale yellow; rostrum brownish; antennæ yellowish; abdomen straw-colour. Head sparingly provided with spiny hairs; abdominal tergites moderately pilose, with longer spiny hairs along posterior border.

Head spherical; rostrum conical; front surface of head in level with anterior surface of rostrum; antennæ 12-jointed, 3rd joint nearly as long as 2nd, 4th and 2nd joint subequal; pronotum saddle-shaped, anterior border concave, not emarginate.

Worker.—Head yellowish; abdomen whitish; anterior corners of transversal band brown; head and abdominal tergites densely provided with subequal hairs.

Head elongate-oval; sutures of head indistinct; basal portion of clypeus swollen, much shorter than half the width: antennæ 13-jointed, 2nd joint as long as 3rd; pronotum saddle-shaped, anterior border strongly elevated.

EAST INDIAN TERMITES.

Length of body								• •	3,00 mm.	
Width of head								• •	0,75 mm.	
Width of pronot	um	• •				٠			0,44 mm.	
Habitat — Dobo	Arı	ie Te	land	(Du	tch	New	Guit	nea).	collected	1

Habitat.—Dobo, Arue Island (Dutch New Guinea); collected by Mr. Kanehira on May 17, 1913.

Remarks.—The present species is closely allied to *Eutermes* javanicus Holmgren, but has the 3rd joint of antennæ in the soldier as long as the 2nd, instead of being equal, while the head and pronotum of the workers are much narrower.

18. Eutermes (Eutermes) sandakanensis nov. sp.

(Pl. X., fig. 8).

Imago unknown.

Soldier.—Very closely allied to *Eutermes havilandi* Desneax, but the head is shorter and narrower and is provided with 13-jointed antennæ, in which the 2nd joint is subequal to the 3rd, and the 4th joint longer than the 3rd.

Length of body	• •		 2,50-3,00 mm.
Length of head with rostrum		•	 1,25 mm.
Length of head without rostrum		•••	 0,75 mm.
Width of head	• •	• •	 0,75 mm.
Width of pronotum			 0,41 mm.

Worker.—Also closely resembling same of *E. havilandi*. Antennæ 14-jointed, 3rd joint slightly shorter than the 2nd and twice as long as the 4th; anterior part of transversal band not depressed; pronotum saddleshaped, anterior border not emarginate.

Length of body	••,			• • •	3,50 mm.	
Width of head				• •	1,00 mm.	
Width of pronotum	•••		•," ••		0,56 mm.	
Habitat.—Sandakan,	Borneo;	collected	by	Mr.	Kanehira	on
August 7, 1913.						

M. OSHIMA:

578

19. Eutermes (Sublitermes) Kanehiræ nov. sp.

(Pl. X., fig. 14).

Imago unknown.

Soldier.—Head dark brown, tip of rostrum paler; antennæ and abdomen straw-colour. Head pilose, microscopical hairs mingled with longer spiny ones, the latter very few; abdominal tergites densely provided with subequal hairs.

Head ovoid, the sides strongly converging anteriorly; rostrum cylindrical, slender, shorter than head, its anterior surface making a weak curve with the anterior surface of head; antennæ 11-jointed, 2nd joint as long as 3rd; mandibles without apical portion; pronotum saddle-shaped, short, anterior border not emarginate.

Length of body			 • •	3.00 mm.
Length of head with rostrum		٠.	 	1,12 mm.
Length of head without rostrum	• •		 ٠	0,75 mm.
Width of head			 	0,66 mm.
Width of pronotum			 	0,34 mm.

Worker.—Head pale yellow; abdomen whitish; anterior corners of transversal band brown. Head microscopically pilose; abdominal tergites very sparingly provided with hairs.

Head round; sutures of head indistinct; basal portion of elypeus shorter than half the width; antennæ 12-jointed, 2nd joint twice as long as 3rd; pronotum saddle-shaped, anterior border not emarginate.

Length of body			• • • •	 	 	3,50 mm.
Width of head		• •	. , .	 		0,72 mm.
Width of pronoti	ım -			 		0.41 mm.

Habitat.—Dobo, Arue Island (Dutch New Guinea); collected by Mr. Kanehira on May 7, 1913.

20. Eutermes (Tumulitermes) boetoni nov. sp.

(Pl. X., fig. 11).

Imago uuknown.

Soldier.—Head dark brown; abdominal tergites yellowish brown, sternites straw-colour; antennæ yellowish brown; anterior border of pronotum brown. Head sparingly provided with long spiny hairs; abdominal tergites densely covered with minute hairs, with a series of longer spiny hairs along the posterior border.

Head broadly oval, the sides converging anteriorly; rostrum conical, its anterior surface in a plane with the anterior surface of head; basal part of rostrum slightly swollen dorsally; antennæ 13-jointed, 3rd joint as long as or slightly longer than 2nd, 4th joint shorter than 3rd; pronotum saddle-shaped, very short, with anterior border convex, not emarginate.

Length of body			• ` •	3,20–3,80 mm.
Length of head with rostrum				1,28-1,38 mm.
Length of head without rostrum		• •		0,84 mm.
Width of head				0,84 mm.
Width of pronotum	٠			0,41 mm.

Worker—Head chestnut brown; sutures of head, anterior border of transversal band, basal portion of clypeus, and abdomen pale yellow. Head and abdominal tergites provided with subequal hairs.

Head quadrate, slightly longer than broad; basal portion of clypeus swollen, nearly half as long as broad; antennæ 14-jointed, 2nd joint as long as 3rd, 4th joint shorter than 3rd; mandibles with slender, short apical portion; pronotum saddle-shaped, anterior border not emarginate.

Length of body		 			 • •		3,50 mm.
Width of head		 •	• •	• •	 	• •	c,81 mm.
Width of pronot	um .	 •			 	4. 7	0,44 mm.

M. OSHIMA:

Habitat.—Boeton, Celebes; collected by Mr. Kanehira on April 29, 1913.

21. Eutermes (Trinervitermes) menadoensis nov. sp.

(Pl. X., figs. 9-10).

Imago unknown.

Soldier (the larger form).—Head reddish brown, abdomen straw-coloured. Head coarsely provided with microscopical hairs, mingled with a few longer spiny hairs; abdominal tergites moderately pilose, with a series of longer spiny hairs along the posterior border.

Head broadly oval; rostrum conical, its anterior surface in the same plane as the anterior surface of head, with a slight swelling behind the junction to head; antennæ 13-jointed, 3rd joint twice as long as 2nd, 4th joint as long as 2nd; mandibles with rudimentary apical portion; pronotum saddle-shaped, anterior border scarcely indented in the middle, sides rounded.

Soldier (the smaller form).—With all the characters of the larger form but smaller.

 Length of body
 2,50-3,20 mm.

 Length of head with rostrum
 1,53-1,63 mm.

 Length of head without rostrum
 0,97-1,00 mm.

 Width of head
 0,97-1,06 mm.

 Width of pronotum
 0,50 mm.

Worker.—Head dark brown; basal portion of clypeus pale yellow; sutures of head and abdomen yellowish white. Head sparingly pilose; abdominal tergites provided with short hairs.

EAST INDIAN TERMITES.

Head nearly pentagonal, sides slightly converging anteriorly; basal portion of clypeus shorter than half the width, markedly swollen; antennæ 14-jointed, 2nd joint as long as 3rd, 4th joint shorter than 3rd; pronotum saddle-shaped, anterior border not emarginate.

22. Eutermes (Grallatotermes) luzonicus nov. sp.

(Pl. X., figs. 15-16).

Imago unknown.

(July 9, 1913); collected by Mr. Kanehira.

Soldier (the larger form).—Head dark brown; abdomen dark yellow, shiny. Head very sparingly provided with spiny hairs; abdominal tergites densely provided with minute hairs, two or three posterior tergites with longer spiny hairs along the posterior border.

Head broadly oval; rostrum conical, its anterior surface making a curve with the anterior surface of head, basal part slightly swollen dorsally; mandibles with a short apical portion; antennæ 13-jointed, 3rd and 4th joints longer than 2nd; pronotum saddle-shaped, anterior border slightly emarginate at middle, posterior border rounded.

Soldier (the smaller form).—Head and abdominal tergites nearly smooth, very sparingly provided with spiny hairs; antennæ 13-jointed, 3rd joint nearly as long as 2nd.

M. OSHIMA:

Worker (the larger form).—Head chestnut brown, sparingly provided with spiny hairs; abdominal tergites covered with minute hairs, posterior ones with longer hairs.

Head quadrate, with rounded posterior border; sutures of head distinct; basal portion of clypeus much shorter than half the width, slightly swollen; antennæ 14-jointed, 3rd joint longer than 2nd, 4th joint shorter than 3rd; pronotum saddle-shaped, anterior border two-lobed.

 Length of body
 ...
 5.00 mm.

 Width of head
 ...
 1,25 mm.

 Width of pronotum
 ...
 0,78 mm.

Worker (the smaller form).—Head dark brown, transversal band considerably paler. Head coarsely pilose, abdominal tergites densely provided with minute hairs, with a series of spiny hairs along the posterior border; sutures of head very distinct; antennæ 14-jointed, 2nd joint as long as 3rd, 4th joint much shorter than 3rd; pronotum saddle-shaped, anterior and posterior borders rounded, not emarginate at middle.

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Genus Microcerotermes Wasmann.

23. Microcerotermes los-banosensis nov. sp.

(Pl. X., fig. 6).

Imago unknown.

Soldier.—Head yellow; mandibles brown; abdomen white. Head very sparingly pilose; abdominal tergites thinly provided with microscopical hairs.

Head quadrangular, elongated, with rounded corners, slightly vaulted dorsally, truncated in front; no fontanelle; posterior border of clypeus arcuate, anterior border straight; labrum short and broad, tongue-shaped; mandibles slender, sabre-shaped, with strongly incurved piercing tip, masticating edge minutely serrated; antennæ 13-jointed, 1st joint very stout, 3rd joint shorter and narrower than 2nd, 4th joint as long as 2nd; pronotum saddle-shaped, anterior and posterior border rounded.

Length of body		 5,50 mm.
Length of head with mandible		 2,56-2,66 mm.
Length of head without mandible	• •	 1,66-1,72 mm.
Width of head		 1,03 mm.
Width of pronotum		 0,34 mm.
Length of pronotum		 0,66 mm.

Worker.—Head pale yellow; abdomen white. Head moderately pilose; abdominal tergites deusely provided with minute hairs.

Head broadly oval, slightly longer than broad; sutures of head indistinct, whitish; basal portion of clypeus half as long as broad, anterior border straight, posterior border convex, slightly swollen, with a shallow median groove; antennæ 13-jointed, 3rd joint minute, half as long as 2nd, 4th joint langer than 3rd; pronotum saddle-shaped, anterior border slightly emarginate at middle.

M. OSHIMA:

Length of body							• •	4,20 mm.
Width of head		• •	• •	. •				0,94 mm.
Width of pronotum		•		• •				0,58 mm.
Habitat.—Los-Banos,	Luz	on;	colle	cted	by	Prof.	Bal	ker.

24. Microcerotermes distans (Haviland).

(Pl. X., fig. 5).

Soldier.—Head reddish yellow; pronotum yellow; abdomen straw-coloured, with dark white patches due to the contents of alimentary canal.

Head cylindrical, flattened, truncated in front; fontanelle distinct, minute, situated just behind forehead; labrum tongue-shaped, broad, with pointed tip; mandibles sabre-shaped, masticating edge irregularly serrated; antennæ 13-jointed, 2nd joint twice as long as 3rd; pronotum saddle-shaped, anterior border distinctly indented in the middle; apical joint of tibia with 3 spines at tip.

Worker.—Head pale brown, abdomen whitish. Head sparingly pilose; abdominal tergites densely provided with hairs.

Head round; basal portion of clypeus markedly swollen, half as long as broad, anterior border straight, posterior border convex; fontanelle indistinct; antennæ 13-jointed, 2nd joint longer than 3rd; pronotum saddle-shaped.

Habitat.—Ambon, Moluccas; collected by Mr. Kanehira, date unknown.

EAST INDIAN TERMITES.

Explanation of plates,

Plate IX.

- Fig. 1. Coptotermes flavicephalus. Soldier.
- Fig. 2. Coptotermes bornensis. Soldier.
- Fig. 3. Coptotermes dobonicus. Soldier.
- Fig. 4. Coptotermes travians. Soldier.
- Fig. 5. Coptotermes hongkonensis. Soldier.
- Fig. 6. Termes (T.) Copelandi. Smaller form of soldier.
- Fig. 7. Termes (T.) Copelandi. Larger form of soldier.
- Fig. 8. Termes (M.) philippinensis. Smaller form of soldier.
- Fig. 9. Termes (M.) philippinensis. Larger form of soldier.
- Fig. 10. Termes (M.) luzonensis. Smaller form of soldier.
- Fig. 11. Termes (M.) luzonensis. Larger form of soldier.
- Fig. 12. Odontotermes (O.) celebensis. Soldier.

Plate X.

- Fig. 1. Parrhinotermes inaequalis. Soldier.
- Fig. 2. Rhinotermes (S.) tarakanensis. Smaller form of soldier.
- Fig. 3. Rhinotermes (S.) longirostris. Smaller form of soldier.
- Fig. 4. Rhinotermes (S.) longirostris. Larger form of soldier.
- Fig. 5. Microcerotermes distans. Soldier.
- Fig. 6. Microcerotermes los-banosensis. Soldier.
- Fig. 7. Eutermes (H.) spinocephalus. Soldier.
- Fig. 8. Eutermes (E.) sandakanensis. Soldier.
- Fig. o. Eutermes (Tr.) menadoensis. Larger form of soldier.
- Fig. 10. Eutermes (Tr.) menadoensis. Smaller form of soldier.
- Fig. 11. Eutermes (Tum.) boetoni. Soldier.
- Fig. 12. Eutermes (E.) doboensis. Soldier.
- Fig. 13. Eutermes (E.) buitenzorgi Soldier.
- Fig. 14. Eutermes (S.) Kanehirae. Soldier.
- Fig. 15. Eutermes (G.) luzonicus. Larger form of soldier.
- Fig. 16. Eutermes (G.) luzonicus. Smaller form of soldier.